

Remarks

Reconsideration and withdrawal of the rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 11-20 are now pending in the application, with Claims 11, 14, 16 and 18 being independent. Claim 14 has been amended and Claims 18-20 have been added herein. Support for the newly-presented claims can be found at least in Figs. 1 and 3-5 and the corresponding description in the specification.

Claims 11, 12 and 14-17 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,835,284 (Takahashi et al.). Claims 11-13, 16 and 17 were rejected under § 102 as being anticipated by U.S. Patent No. 5,729,331 (Tanaka et al.). These rejections are respectfully traversed.

As is recited in independent Claim 11, the present invention relates to an exposure apparatus including a projection optical system of a catadioptric type, and an optical element disposed on a reciprocating light path of the projection optical system. The optical element is movable to change aberration of the projection optical system to be produced due to exposure.

As is recited in independent Claim 14, the present invention relates to an exposure apparatus including a projection optical system of a catadioptric type. The projection optical system includes (i) a first mirror for reflecting light from a light source thereby to define a reciprocating light path, and (ii) a second mirror disposed at a position not intercepting a path of the light from the light source to the first mirror, for directing

light from the first mirror along a one-way light path off the reciprocating light path. The apparatus also includes an optical element disposed on the reciprocating light path of the projection optical system. The optical element is movable to change aberration of the projection optical system.

As is recited in independent Claim 16, the present invention relates to an exposure apparatus including a projection optical system of a catadioptric type, an optical element disposed on a reciprocating light path of the projection optical system, and an actuator for actuating the optical element to change aberration of the projection optical system.

As is recited in independent Claim 18, the present invention relates to an exposure apparatus including a projection optical system of a catadioptric type. The projection optical system includes an optical element disposed on a reciprocating light path of the projection optical system at a position where a light passing region of the light traveling along a forward light path and a light passing region of the light traveling along a backward light path are overlapped with each other, and the optical element is movable along an optical axis direction.

Takahashi et al. is directed to a catadioptric optical system. For optical-axially symmetric components, the magnification and astigmatism aberrations can be corrected by shifting each lens in the optical axis direction, whereas asymmetric distortion aberrations and asymmetric astigmatism can be corrected by rotating each lens around a rotation axis perpendicular to the optical axis.

As understood by Applicant, Takahashi et al. at most discloses that lenses L1, L2, L3 and L4 of the unidirectional optical apparatus A1 are movable so that the aberration is changed. Note col. 4, line 59 to col. 5, line 10. However, the optical path of the unidirectional optical apparatus A1 is not a reciprocating light path.

Accordingly, Takahashi et al. does not disclose or suggest an optical element disposed on a reciprocating light path of a projection optical system, with the optic element being movable to change aberration of the projection optical system, as is recited in independent Claims 11 and 14.

Nor does Takahashi et al. disclose or suggest an optical element disposed on a reciprocating light path of a projection optical system and an actuator for actuating the optical element to change aberration of the projection optical system, as is recited in independent Claim 16.

Furthermore, Takahashi et al. does not disclose or suggest an optical element disposed on a reciprocating light path of a projection optical system at a position where a light passing region of light traveling along a forward light path and a light passing region of light traveling along a backward light path are overlapped with each other, with the optical element being movable along an optical axis direction, as is recited in newly-presented independent Claim 18.

Thus, Takahashi et al. fails to disclose or suggest important features of the present invention recited in the independent claims.

Tanaka et al. is directed to an exposure apparatus in which the projection magnification is changed by moving a lens disposed on a reciprocating light path. Note

col. 54, lines 48-65. However, as described at lines 8-19 of col. 54, it is the projection magnification, not the aberration to be produced due to exposure, that is changed by the change of the size of plate 9.

Thus, Tanaka et al. also fails to disclose or suggest an optical element disposed on a reciprocating light path of a projection optical system, with the optical element being movable to change aberration of the projection optical system, as is recited in independent Claims 11 and 14.

For similar reasons, Tanaka et al. also fails to disclose or suggest an optical element disposed on a reciprocating light path of a projection optical system and an actuator for actuating the optical element to change aberration of the projection optical system, as is recited in independent Claim 16. Moreover, Applicant submits that while Tanaka et al. may disclose movability of a lens disposed on a reciprocating light path, there is no disclosure of an actuator for moving the lens. Such a lens can be moved without an actuator, such as by manual power. For these additional reasons, Tanaka et al. is not believed to disclose or suggest the features of Claim 16.

While Tanaka et al. may disclose movability of a lens disposed adjacent to field stop 814 as shown in Fig. 55, a light passing region of light traveling along a forward light path and a light passing region of light traveling along a backward light path are not overlapped with each other. Therefore, Tanaka et al. cannot disclose or suggest an optical element disposed on reciprocating light path of a projection optical system at a position where a light passing region of light traveling along a forward light path and a light passing

region of light traveling along a backward light path are overlapped with each other, as is recited in independent Claim 18.

Accordingly, Tanaka et al. also fails to disclose or suggest important features of the present invention recited in the independent claims.

Thus, independent Claims 11, 14, 16 and 18 are patentable over the citations of record. Reconsideration and withdrawal of the § 102 rejections are respectfully requested.

For the foregoing reasons, Applicant respectfully submits that the present invention is patentably defined by independent Claims 11, 14, 16 and 18. Dependent Claims 12, 13, 15, 17, 19 and 20 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicant submits that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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